



**Seventh Semester B.E. Degree Examination, July/August 2021**  
**Hydrology and Irrigation Engineering**

Time: 3 hrs.

Max. Marks: 80

**Note: 1. Answer any FIVE full questions.**  
**2. Missing data if any may be assumed suitably.**

- 1 a. Explain Horton's representation of Hydrological cycle. (08 Marks)  
 b. Give the importance of Hydrology as applied to various fields. (08 Marks)
- 2 a. Explain the different types of precipitation with sketches. (08 Marks)  
 b. A catchment has seven raingauge stations. In a year the annual rainfall recorded by the gauges are as follows :

Station	A	B	C	D	E	F	G
Rainfall (cm)	130	142.1	118.2	108.5	165.2	102.1	146.9

For a 5% error in the Estimation of the mean rainfall, calculate the minimum number of additional raingauges to be installed in the catchment. (08 Marks)

- 3 a. Explain the various methods of Estimation of Lake Evaporation. (08 Marks)  
 b. Mention the various factors affecting Evapo transpiration. (08 Marks)
- 4 a. Define the term Infiltration capacity of soil. Explain Hortan's Infiltration capacity curve, with a neat sketches. (08 Marks)  
 b. A reservoir has an average surface area of 20km<sup>2</sup> during June 2012. In that the mean rate of flow was 10m<sup>3</sup>/sec, mean outflow was 15m<sup>3</sup>/sec. Monthly rainfall was 10cm and change in storage was 16 million cubic meter. Assuming the seepage losses to be 1.8cm, estimate the Evaporation in that month. (08 Marks)
- 5 a. Explain the factors affecting Runoff. (08 Marks)  
 b. What are the components of hydrograph? Explain how base flow is separated from a simple storage hydrograph. (08 Marks)
- 6 a. Mention the Applications and Limitations of Unit Hydrograph theory. (08 Marks)  
 b. Following ordinates of Flood Hydrograph (FGH) were recorded in a stream resulting from a storm is a catchment having an area of 15,400 hectares. Base flow is 5 cumecs.

Time in hours	0	12	24	36	48	60	72	84	96
Discharge in cumecs	5	10	20	35	30	20	15	10	5

- i) Find the Runoff in cm. (08 Marks)
- ii) Find the ordinates of the unit hydrograph. (08 Marks)
- 7 a. What are the benefits and ill effects of Irrigation? (08 Marks)  
 b. Explain the factors affecting duty of Irrigation water. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

- 8 a. Explain the necessity of Irrigation for tropical country like India. (08 Marks)  
b. Determine the discharge at the head works from the following data :  
GCA = 500 Hectares , CCA = 80% of GCA , 50% of CCA is under wheat cultivation.  
30% of CCA is under pulse cultivation , 10% of CCA is under paddy cultivation.  
The duty of water is 1800 Hect/cumec for wheat  
1000 Hect/cumec for paddy  
2000 Hect/cumec for pulses.  
Conveyance losses constitute 40% of release at head – works. (08 Marks)
- 9 a. Give the classification of canals. Explain salient features of each of them. (08 Marks)  
b. Give the comparison between Lacey's theory and Kennedy's theory. (08 Marks)
- 10 a. Explain with a neat sketch, the various zones of a reservoir. (08 Marks)  
b. Design an irrigation canal section to carry 50 cumecs of water at a slope of 0.25 meter per km. Given that  $N = 0.0225$  and  $m = 1.0$ . With usual notations. (08 Marks)

\*\*\*\*\*